

Application No.: 10/540,662
Amendment dated: June 27, 2008
Reply to Office Action of December 27, 2007
Attorney Docket No.: 0065.0002US1

This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims

1 - 36. (Cancelled)

37/ (New) A method of processing sulfide minerals and concentrates by oxidation of sulfide minerals in an aqueous medium using an oxidizing agent which is one ore more of nitric acid, nitrous acid and their oxides, the method comprising:
subjecting a slurry containing the sulfide minerals to oxidation under controlled conditions of slurry acidity, wherein oxidation of the sulfide minerals is performed using the oxidizing agent which is one ore more of nitric acid, nitrous acid and their oxides and is realized under agitation;
forming a sulphuric acid as a result of sulfide oxidation and constantly neutralizing the sulphuric acid using an acidity neutralizer to an acidity level at which no formation of elementary sulfur occurs;
removing of heat released during the sulfide oxidation from an oxidation reactor in which the temperature is maintained in a range from 20 to 90 °C and in which a liquid-to-solid ratio in the slurry is between 1:1 to 5:1.

38. (New) The method according to claim 37 in which the acidity neutralizer is one or more of CaCO₃, MgCO₃, Ca(OH)₂, CaO, NaOH and CaHPO₄.

39. (New) The method according to claim 37 in which the temperature is maintained in the range of 65-85 °C.

40. (New) The method according to claim 37, further comprising

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separating nitrogen oxides, formed in said method, from inert nitrogen in the air by absorbing the nitrogen oxides in a sulfuric acid solution which has a concentration in the range 75 - 98%;

denitrating the sulfuric acid solution thermally by heating it to a temperature not exceeding 250°C, and/or chemically by introduction of a denitrating substance.

41. (New) The method according to claim 40, in which the denitrating substance is one or more of an alcohol, formaldehyde and other chemical reducing agents.

42. (New) The method according to claim 39, further including separating the nitrogen oxides, formed in said method, from inert nitrogen in the air by absorbing the nitrogen oxides in a monovalent copper salt solution;

denitrating the monovalent copper salt solution using a dosed supply of compressed air, with the optional simultaneous heating of the solution.

43. (New) The method according to claim 42 in which the monovalent copper salt solution contains a stabilizing agent to impede oxidation of copper from monovalent to bivalent.

44. (New) The method according to claim 43 in which the stabilizing agent is one or more of tributyl phosphate, adiponitrile, or reducing agents such as formaldehyde or hydrazine.

45. (New) The method according to claim 37, further comprising regenerating a dinitrogen trioxide N_2O_3 from a nitric oxide NO using air or oxygen.

46. (New) The method according to claim 37, further comprising regenerating a dinitrogen trioxide N_2O_3 from a nitric oxide NO formed in said method using pure oxygen in an individual regeneration oxidizer at a temperature of 15-25 °C, so as to prevent the accumulation of nitric acid in the slurry.